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AIRCRAFT SPRAY SYSTEM MODIFICATIONS FOR  
APPLICATION OF TECHNICAL MALATHION

AUG 26 1965

C &amp; R-PREP.

I. Insecticide Tanks:

Equip small aircraft (Ag Cat, Pawnee, Stearman, etc.) with a valve arranged so that you can drain the tank completely without draining the pump and boom. You may need to drain the tank to calibrate the spray system.

Large aircraft need a 4-6 gallon sump capable of completely draining the tank while the plane is in flight or on the ground. Attach a valve to the low point in the sump.

A clear plastic tubing sight gauge will simplify calibration. This gauge should show (1) the last 10 gallons in the tank of small aircraft, and (2) the last 25 gallons in large aircraft.

Note: Do not use paint in tanks to stop leaks. Technical malathion will slowly loosen paint and clog screens and nozzles.

II. Pump:

Use a gear, centrifugal, or other rotary pump that can pump the required flow rate at 40 psi to assure uniform flow and optimum nozzle performance. The pump normally used on Ag Cats, Pawnees, etc., can be adapted as described in Section III. If you plan to use a centrifugal pump on large aircraft, it should be no larger than one inch. Attach it to the tank sump so that its inlet is at least as low as the sump when the aircraft is in level flight.

III. Bypass:

Use a bypass to connect the spray pump outlet with the spray pump inlet if the spray pump capacity is greater than needed for the application rate. Use a line the same size as the

pump outlet. The standard bypass normally used to control flow rate or to keep powders in suspension must be kept closed to prevent aerating the malathion.

On a typical spray system (see diagram A), route the bypass line from the pump outlet to the pump inlet. Boom pressure is regulated by a valve--separate from the on-off valve--in the bypass line. If this valve can be controlled from the cockpit, you can make pressure adjustments during flight.

When you use a pump in which the inlet flange is attached directly to the bottom of the tank (such as on a Transland or similar spray system) (see diagram B) extend the bypass line into the tank with the discharge end directed toward and within 1/4 inch of the pump inlet. The 3-way valve used to turn spray on and off is also used to regulate the boom pressure.

On Piper Pawnee and some other small aircraft (see diagram C), boom pressure is controlled by the 3-way on-off spray valve.

#### IV. Air Bleed Lines:

Attach a 1/8 to 1/4-inch air bleed line to each point that may trap air in the pressure side of the spray system. Such points include the impeller chamber of a centrifugal pump and the outer ends of the spray boom (see Section V). Attach the other end of the air bleed line to the top of the spray tank. Direct the discharge from the line against the side of the tank to prevent aeration.

#### V. Nozzles:

On Ag Cats, Pawnees, etc., use at least five nozzles to spray 1/2 pint per acre. Increase the number as the application rate increases. Use flat spray nozzle tips, similar to Spraying Systems 80015 or 8002, and point them straight downward. Equip each nozzle with a 100-mesh screen.

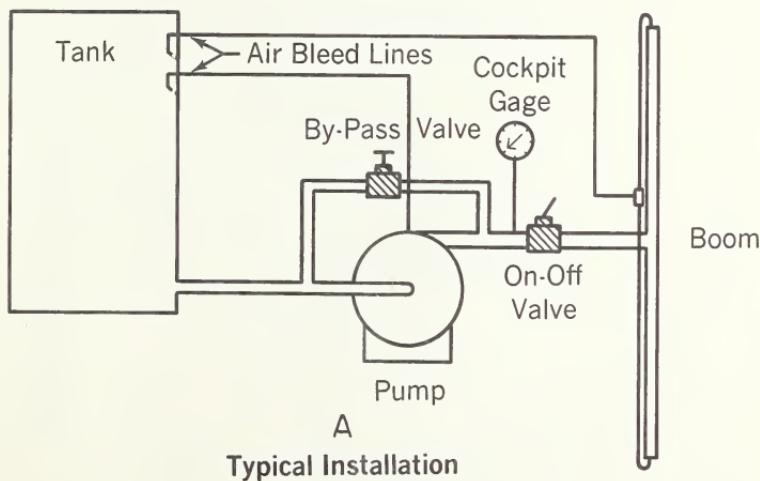
On aircraft that operate at more than 120 mph, use flat spray nozzle tips similar to Spraying Systems 8010 or 8015 and point

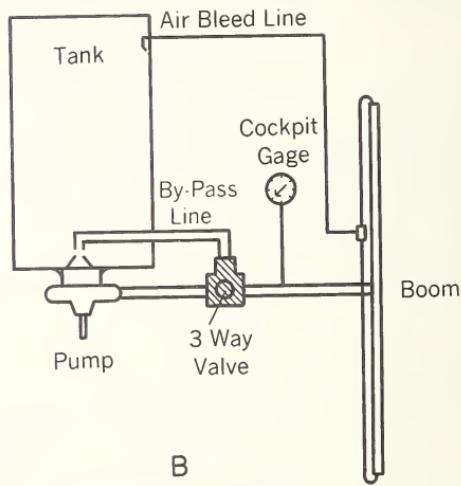
them straight aft. Screens are not required but may be used in these nozzles.

Space the nozzles so that the distance between the left and right outboard nozzles is approximately equal to 3/4 of the wingspan. If the boom is no longer than 3/4 of the wingspan, you can attach a nozzle to each end of the boom and thus eliminate the need for a boom air bleed line. The remaining nozzles can be evenly spaced across the span if the aircraft is to be flown at a height of 15 or more feet. If it is to be flown at crop level, use an asymmetrical nozzle arrangement to correct for propeller and wingtip vortices.

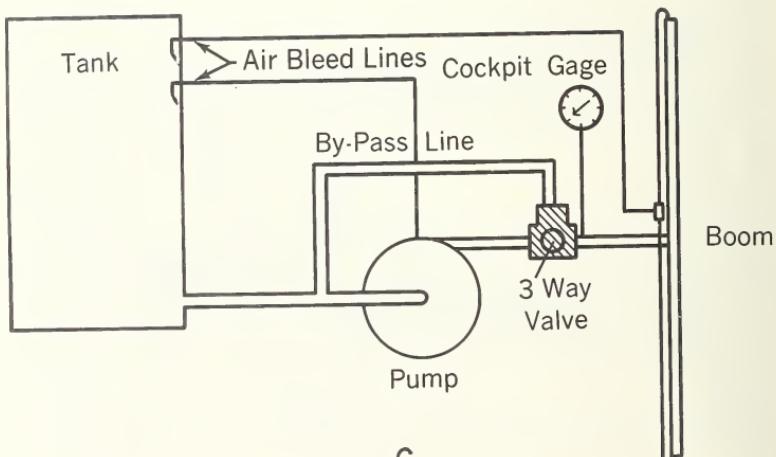
#### VI. Screen:

Include a 50-mesh screen in the spray system. Use one large enough to handle a flow rate at least four times the rate required to spray the amount per acre to be applied. If possible, locate this screen between the tank and pump (sump and pump on large aircraft) so that it can be removed for cleaning without draining the tank. To avoid delays caused by plugged screens and nozzles, clean the spray system thoroughly before spraying technical malathion.





B  
Transland Installation



C  
Piper Pawnee Installation



